**Geodesic Domes**

**What's the strongest dome you can build out of newspaper?**

You have likely seen the Geodesic dome structures used in Architecture. Spaceship Earth at Disney’s’ Epcot Center in Florida and Biosphere 2 in Tucson, Arizona are two examples. The basic dome or sphere is an efficient shape since it encloses the most volume with the least surface.

A Geodesic Dome is a sphere shape created from Interlocking triangles to provide maximum structural strength. The Geodesic Dome’s strength is due to the fact that the triangles are very stable shapes. It is very difficult to distort a triangle because compression at one joint is balanced by Tension along the opposite side. The Geodesic Dome design distributes the loads over all different Triangles that comprise it.

You can build a giant geodesic dome out of newspaper. First, gather some friends or family members to help you.

**What You Will Need**
• many newspapers
• masking tape
• measuring tape
• markers, glitter, beads, and glue for decorating

**Make a Prediction**
Predict how many magazines you think your newspaper dome will be able to support.

**Try It Out**
1. Stack three flat sheets of newspaper together. Starting in one corner, roll the sheets up together as tightly as you can to form a tube. When you reach the other corner, tape the tube to keep it from unrolling. Repeat until you have 65 tubes.
2. Now cut down the tubes to make 35 "longs" and 30 "shorts." Longs: Cut off both ends of a tube until it is 71 centimeters long. Use this tube as a model to create 34 more longs. Be sure to mark all the longs clearly in some way, such as with colored tape, so you can tell them apart from the shorts. Decorate the tubes if you like. Shorts: Cut off both ends of another tube until it is 66 cm long. Use this tube as a model to create 29 more shorts. Decorate the tubes if you like.
3. First, tape 10 longs together to make the base of the dome.
4. Tape a long and a short to each joint. Arrange them so that there are two longs next to each other, followed by two shorts, and so on, as shown.

5. Tape the tops of two adjacent shorts together to make a triangle. Tape the next two longs together, and so on all the way around.

6. Connect the tops of these new triangles with a row of shorts. (The dome will start curving inward.)

7. At each joint where four shorts come together, tape another short sticking straight up. Connect this short to the joints on either side with longs, forming new triangles.
8. Connect the tops of these new triangles
with a row of longs.

9. Finally, add the last five shorts so that they meet at a single point in the center of the dome. (You might need to stand inside the dome to tape them together.) To test your dome's strength, see how many magazines you can load on top.

**Explain It**
How strong is your dome? Did the results surprise you? Why or why not? What was the hardest part about creating the dome?

**Build on It**
How could you make your dome stronger without interrupting the space underneath it? Make a prediction and test it.

**6 Grades at Stake!**

1. Research and Journal
2. Design and Planning
3. Time Management/Performance
4. Conclusions/application and Reflections
5. Overall Impact/IB
6. Presentation